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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,246	09/08/2003	Tadashi Nomura	36856.1117	3071

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EXAMINER

TAKAOKA, DEAN O

ART UNIT	PAPER NUMBER
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2817

DATE MAILED: 03/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

3/1

Office Action Summary

Application No.

10/656,246

Applicant(s)

NOMURA ET AL.

Examiner

Dean O. Takaoka

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-14 and 16-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6,9-11,16-21,27-30 and 34-48 is/are allowed.
- 6) ☒ Claim(s) 2,4,5,7,8,14,22-26 and 31-33 is/are rejected.
- 7) ☒ Claim(s) 3,12 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/8/06
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2, 4, 5, 7, 22, 23, 25, 26, 31 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Ruby et al. (U.S. Patent No. 6,424,237) and as evidenced by Applicant's prior art of Ketcham with respect to claim 2.

Ruby et al. teaches a piezoelectric resonator comprising a substrate and a concavity; a vibrating section with a thin film section (60) having opposing upper (64) and lower (62) electrodes disposed over the opening; a heat dissipating film located over at least the thin-film section so as not to cover the vibrating section (76 et al.; where reflector and electrodes comprise materials such as Al and where metal dissipates heat – col. 6, line 65 to col. 7, line 10; further where Al would also dissipated heat such as Applicant's Al metal film; and where 76 does not cover the section of upper and lower electrodes defined as the vibrating section in a similar manner as Applicant's showing in Fig. 2 et al.); where the heat dissipating film has a thermal conductivity of approximately 150W/(mK) or higher (where the reflector and electrode components comprise metals such as Al where Al inherently comprises a higher thermal conductivity of approximately 150W/(mK), such as evidenced by Applicant's prior art of Ketcham, page 107, paragraph with respect to Fig. 3 and Al); a distance

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between the heat dissipating film and the vibrating section is approximately one half wavelength (where the term "approximately" is broad where the limits are not defined by the claim, thus where d_1, d_2, d_3 comprising $3/4\lambda$ may be broadly defined as approximately one half wavelength; or in the alternative where $1/4\lambda$ may be broadly defined as approximately one half wavelength with respect to Fig. 7); where the piezoelectric material is AlN; for use in a filter, duplexer, and for communications devices.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruby et al. in view of Larson, III et al. (U.S. Patent No. 6,215,375).

Ruby et al. teaches the piezoelectric resonator above but does not teach the vibrating section comprising a polygonal shape.

Larson, III et al. teaches a piezoelectric resonator with a vibrating section comprising a polygonal shape with respective edge lengths and distances.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the electrode and cavity disclosed by Ruby et al. with the polygonal shape disclosed by Larson, III et al. Such a modification would have been obvious where Larson, III et al. teaches providing a resonator with an absorption or

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transmission spectrum that does not include irregularities generated by transverse resonant modes (col. 2, lines 16-19 – Larson, III et al.); where both Ruby et al. and Larson, III et al. teach piezoelectric resonators where Larson, III et al. shows the improved resonator over the conventional rectangular configuration such as shown by Ruby et al.; and where both inventions are by the same Assignee, thus suggesting the obviousness of the modification.

Claims 24 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruby et al. in view of Bradley et al. (U.S. Patent No. 6,462,631).

Ruby et al. teaches the piezoelectric resonator for use in a filter, duplexer, and for communications devices above but is silent with respect to a well-known ladder filter configuration.

Bradley et al. also shows a piezoelectric resonator in a well-known ladder configuration used in a filter, and duplexer for use in communications devices.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the resonator disclosed by Ruby et al. in the devices disclosed by Bradley et al. Such a use of the resonator would have been obvious where Bradley et al. shows the implementation of the resonator in well-known devices where it is well-known to use ladder type filters in duplexers for multi pole transmit and receive filters; where both Ruby et al. and Bradley et al. teach the piezoelectric resonators for use in filters and duplexers for communications devices; and where both

inventions are by the same Assignee and common inventor, thus suggesting the obviousness of the modification.

Allowable Subject Matter

Claims 6, 9 – 11, 16 – 21, 27 – 30 and 34 – 48 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not teach or suggest at least the limitations of the independent claims, nor would it be obvious to combine the prior art of record where one of the opening and concavity is entirely covered by the heat dissipating film except over the vibrating section (claim 6); the vibrating section having a polygonal shape where the distance between the longest edge of the vibrating section and the edge of the opening and the concavity is approximately one half a vibrating wavelength (claims 10, 17).

Ruby et al. and Kaitila et al. teach a heat dissipating film but do not teach or suggest the opening and concavity entirely covered by the heat dissipating film except over the vibrating section where Ruby et al. shows spaced reflectors and where Kaitila et al. shows the heat dissipating film (804) not covering the entire cavity in Figs. 8a or 8c).

Larson III et al. shows a vibrating section having a polygonal shape (cavity 60 and electrode 70 – Figs. 4 and 5) but does not teach or suggest relative distances in terms of wavelengths of the electrode, resonant area and cavity, much less distances

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between the longest edge of the vibrating section and the edge of the opening and the concavity is approximately one half a vibrating wavelength.

Claims 3, 12 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dean O. Takaoka whose telephone number is (571) 272-1772. The examiner can normally be reached on 8:30a - 5:00p Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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March 24, 2006